

REMARKS

I. Formalities

Applicants thank the Examiner for acknowledging the claim for priority under 35 U.S.C. § 119, and receipt of the certified copy of the priority document submitted September 7, 2000.

Applicants thank the Examiner for considering the references cited with the Information Disclosure Statements filed September 7, 2000 and November 14, 2000.

Applicants thank the Examiner for accepting the drawings filed on September 7, 2000. Filed concurrently herewith are ten (10) sheets of formal drawings. The Examiner is respectfully requested to acknowledge receipt and to approve these formal drawings.

II. Status of the Application

By the present Amendment, claims 1-4, 7, 9-10, 13, 15, 17-18, 21, 23-25, 28, 32-35, 38-39, 42-43, 48-49, 51, and 56-57 have been amended. In addition, claims 16, 40, 44, 52, and 59-102 have been canceled without prejudice or disclaimer. Claims 103-129 are hereby added to more fully cover various implementations of the invention. Claims 1-15, 17-39, 41-43, 45-51, 53-58, and 103-129 are all the claims pending in the Application, with claims 1, 32, 103, and 119 being in independent form.

III. Claim Rejections Under 35 U.S.C. § 102

The Examiner has rejected claims 23-29, 51-53, 55-57, 74, 76-79, 96-98, 100, and 101 under 35 U.S.C. § 102(e) as being anticipated by U.S.P. 5,870,189 to Uesugi *et al.* (“Uesugi”). This rejection is respectfully traversed.

As an initial matter, Applicants note that Uesugi is in fact a reference under 35 USC § 102 (b), as it was issued on February 9, 1999. The present application was filed on September 7, 2000, more than a year after the reference’s issue date. In any event, Applicants respectfully submit that that claims 23-29, 51-53, 55-57, 74, 76-79, 96-98, 100, and 101 positively recite limitations which are not disclosed (or suggested) by Uesugi.

Uesugi discloses a particle monitor for monitoring in-situ particles, or precursors thereof, existing in a space above a wafer so as to detect, in real time, a spatial distribution of particles. *See* column 3, lines 41-44. In Uesugi, laser source 11 introduces a scanning laser beam into wafer processing equipment 12 and the scanning laser beam is scattered by particles floating therein. *See* column 7, lines 23-28. The scattered light is then received by photo-detector 13, converted to electrical signals, and input to a signal intensity judging device 14. *See* column 7, lines 36-37; column 7, lines 49-53. Further, Uesugi discloses that if the signal input to signal intensity judging device 14 is equal to or larger than a reference intensity I, the display for in-situ cleaning or overhaul is made. *See* column 7, lines 55-58.

In contrast, the present invention relates to an apparatus and a method of processing image data obtained by the particle monitor suggested in Uesugi. Accordingly, the present invention is completely distinguishable from Uesugi.

A. Independent Claim 1

With respect to independent claim 1, the Examiner alleges that signal intensity judging device 14, as disclosed at column 9, lines 40-58 of Uesugi, corresponds to an area detector as defined in Applicants' claim 1. *See* Office Action page 3, lines 4-6; page 6, lines 6-8. Applicants respectfully disagree with the Examiner, and submit that Uesugi fails to disclose or suggest an area detector, which determines pixels located adjacent to each other among pixels having a brightness equal to or greater than a predetermined threshold brightness, as a group of pixels corresponding to an area on which a laser beam scattered by a particle is incident, as recited in claim 1.

In contrast to the requirements of Applicants' claim 1, Uesugi discloses that two distinct reference intensities, I_1 and I_2 , are determined in advance. *See* column 9, lines 40-46. Further, Uesugi discloses that signal intensity judging device 14 compares the intensity of the scattered laser beam detected by photo-detector 13, to the two reference intensities, I_1 and I_2 . *See* column 9, lines 40-46. Specifically, Uesugi discloses that if the intensity of the scattered light is larger than I_1 , then particles have been generated in wafer processing equipment 12. *See* column 9, lines 42-44. Moreover, Uesugi discloses that if the intensity of the scattered light is larger than I_2 , then defects may be caused in a semiconductor device due to the particles floating in wafer processing equipment 12. *See* column 9, lines 45-46. Thus, Uesugi does not disclose an area detector, which determines pixels located adjacent to each other among pixels having a brightness equal to or greater than a predetermined threshold brightness, as a group of pixels corresponding to an area on which a laser beam scattered by a particle is incident, as recited in claim 1.

Consequently, Applicants respectfully submit that independent claim 1 is not anticipated by (i.e. is not readable on) Uesugi *at least* for these reasons. Further, Applicants

respectfully submit that the dependent claims 23-29 are allowable over Uesugi, *at least* by virtue of their dependency on claim 1.

Accordingly, Applicants respectfully request that the Examiner withdraw this rejection.

B. Independent Claim 32

With respect to independent claim 32, the Examiner alleges that the process of comparing the intensity of the scattered light to two predetermined reference intensities, I_1 and I_2 , corresponds to the step of determining pixels located adjacent to each other among pixels having a brightness equal to or greater than a predetermined threshold brightness as a group of pixels corresponding to an area on which a laser beam scattered by a particle is incident, as recited in Applicants' claim 32. *See* Office Action page 3, lines 4-6; page 6, lines 6-8. Applicants respectfully disagree with the Examiner, for the same reasons discussed above with respect to independent claim 1, and submit that Uesugi fails to teach or suggest the aforementioned limitation.

Thus, Applicants respectfully submit that independent claim 32 is patentable over Uesugi for *at least* these reasons. Further, Applicants respectfully submit that the dependent claims 51, 53, and 55-57 are allowable over Uesugi, *at least* by virtue of their dependency on claim 32. Accordingly, Applicants respectfully request that the Examiner withdraw this rejection.

Since dependent claims 52, 74, 76-79, 96-98, 100, and 101 have been canceled without prejudice or disclaimer, the rejection of these claims is moot.

IV. Claim Rejections Under 35 U.S.C. § 103

First, the Examiner has rejected claims 30, 58, and 102 under 35 U.S.C. § 103(a) as being unpatentable over Uesugi. Second, the Examiner has rejected claims 31, 54, 75, and 99 under 35 U.S.C. § 103(a) as being unpatentable over Uesugi and further in view of U.S.P. 6,368,567 to Comita et al (“Comita”). Third, the Examiner has rejected claims 1-7, 9-13, 15-21, 32-35, 37-45, 47-50, 59-63, 65-67, 69-73, 80-83, 85-91, and 93-95 under 35 U.S.C. § 103(a) as being unpatentable over Uesugi in view of U.S.P. 5,929,980 to Yamaguchi *et al.* (“Yamaguchi”). Fourth, the Examiner has rejected claims 8, 14, 22, 36, 46, 64, 68, 84, and 92 under 35 U.S.C. § 103(a) as being unpatentable over Uesugi in view of Yamaguchi, and further in view of Comita. These rejections are respectfully traversed.

A. Independent Claim 1

Applicants respectfully submit that neither Uesugi, Comita, Yamaguchi, nor any combination thereof, teaches or suggests all the limitations of independent claim 1. As explained above with respect to claim 1, Uesugi fails to disclose or suggest an area detector, which determines pixels located adjacent to each other among pixels having a brightness equal to or greater than a predetermined threshold brightness, as a group of pixels corresponding to an area on which a laser beam scattered by a particle is incident. Further, neither Comita nor Yamaguchi teach or suggest this feature. Consequently, Uesugi, Comita, Yamaguchi, and any combination thereof, are incapable of teaching or suggesting the novel limitations of independent claim 1. Accordingly, claim 1 would not have been obvious from Uesugi, Comita, Yamaguchi, and any combination thereof, for *at least* this reason.

Thus, Applicants respectfully request that the Examiner withdraw this rejection.

B. Dependent Claims 2-15, 17-22, 30, and 31

Claims 2-15, 17-22, 30, and 31 incorporate all of the novel and non-obvious features of their base claim 1. As explained above, Uesugi, Comita, Yamaguchi, and any combination thereof, is incapable of teaching or suggesting the novel limitations of base claim 1 and, therefore, dependent claims 2-15, 17-22, 30, and 31 would not have been obvious from the cited references *at least* for this reason.

Since dependent claim 16 has been canceled without prejudice or disclaimer, the rejection of this claim is moot.

Thus, Applicants respectfully request that the Examiner withdraw this rejection.

C. Independent Claim 32

Applicants respectfully submit that neither Uesugi, Comita, Yamaguchi, nor any combination thereof, teaches or suggests all the limitations of independent claim 32. As explained above with respect to claim 32, Uesugi fails to disclose or suggest the step of determining pixels located adjacent to each other among pixels having a brightness equal to or greater than a predetermined threshold brightness as a group of pixels corresponding to an area on which a laser beam scattered by a particle is incident. Further, neither Comita nor Yamaguchi teach or suggest this feature. Consequently, Uesugi, Comita, Yamaguchi, and any combination thereof, are incapable of teaching or suggesting the novel limitations of independent claim 32. Accordingly, claim 32 would not have been obvious from Uesugi, Comita, Yamaguchi, and any combination thereof, for *at least* this reason.

Thus, Applicants respectfully request that the Examiner withdraw this rejection.

D. Dependent Claims 33-39, 41-43, 45-50, 54, and 58

Claims 33-39, 41-43, 45-50, 54, and 58 incorporate all of the novel and non-obvious features of their base claim 32. As explained above, Uesugi, Comita, Yamaguchi, and any

combination thereof, is incapable of teaching or suggesting the novel limitations of base claim 32 and, therefore, dependent claims 33-39, 41-43, 45-50, 54, and 58 would not have been obvious from the cited references *at least* for this reason.

Since dependent claims 40, 44, 52, and 59-102 have been canceled without prejudice or disclaimer, the rejection of these claims is moot.

Thus, Applicants respectfully request that the Examiner withdraw this rejection.

V. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

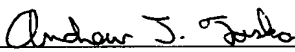
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